What is claimed is;

1- A plastic encapsulated semiconductor device having decreased self and mutual bond wire capacitance, said device including;

a plurality of wire bonds connecting pads on an integrated circuit chip to conductive leads,

a low dielectric constant sheath surrounding each wire, and

a mold compound encasing the chip, sheathed wires, and leads.

2- A device as in claim 1 wherein said dielectric sheath comprises a foamed polymer.

3- A device as in claim 1 wherein thickness of the dielectric sheath is 2.5 microns, minimum on each surface.

4- A device as in claim 1 wherein the effective dielectric constant of the sheath surrounding bond wires is in the range of 1.0 to 2.3.

5- A device as in claim 1 wherein the distance between wires is in the range of 50 to 100 microns.

6-A device as in claim 1 wherein the dielectric constant of the molding compound is in the range of 3.8 to 4.2.

7- A device as in claim 1 wherein the mutual capacitance between bond wires is lower by a factor of

3 as compared to a device wherein the medium separating wires has a dielectric constant of 4.0.

8- A device as in claim 1 wherein said dielectric sheath comprises a polyurethane foam.

9- A device as in claim 1 wherein said dielectric sheath comprises a foamed thermoplastic polymer.

10- A device as in claim 1 wherein said device is packaged in as a Ball Grid Array package.

11- A device as in claim 1 wherein said device is packages as a leaded surface mount package.

12- A semiconductor device encased within a cavity package having reduced self and mutual capacitance of bond wires, said device including;

a plurality of wire bonds connecting pads on an integrated circuit chip to respective conductive leads of a semiconductor package,

a low dielectric constant sheath surrounding each wire, and

a semiconductor package having leads, a substrate, and a housing shell surrounding an open cavity.

13- A device as in claim 1 wherein said dielectric sheath comprises a foamed polymer.

14- A device as in claim 1 wherein said cavity package shell comprises ceramic.

15- A device as in claim 1 wherein said cavity package shell comprises a composite polymer.

16- An insulated wire bond including a conductive wire and a sheath of foamed polymer.

17- A method of packaging a semiconductor device having reduced capacitance bond wires, including the following steps;

attaching a semiconductor chip to a substrate or chip pad of a lead frame,

wire bonding respective ends of a plurality of wires firstly to the pads on the chip, and secondly to leads on said substrate or lead frame,

disposing a polymeric material with foaming agent onto said wire bonds,

allowing the foaming reaction to proceed to near completion,

curing said polymeric material, and

molding a housing or package.